DOCUMENT RESUME

ED 315 715 CG 022 308

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TITLE Adult Criminal Activity among Adolescents Who Were Aggressive and Withdrawn.
PUB DATE Aug 89
NOTE 17p.; Paper presented at the Annual Meeting of the American Psychological Association (97th, New Orleans, LA, August 11-15, 1989).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Academic Achievement; *Adolescents; *Aggression; *Crime; Criminals; Foreign Countries; Grade 7; *Longitudinal Studies; Predictor Variables; Secondary Education; Secondary School Students; Social Behavior; Social Problems; *Withdrawal (Psychology)
IDENTIFIERS Canada

ABSTRACT

Longitudinal studies of the effects of aggression and social withdrawal on later development contribute to an understanding of how socially deviant behaviors may affect future adaptation. This study is concerned with how aggression and social withdrawal are related to criminal activity approximately 10 years after individuals were initially identified. Further, this study examined whether academic achievement provides supplementary or overlapping prediction of crime to that provided by knowledge about social behavior. Information was collected for boys and girls (N=1,704) in grade 7 (time one) about aggression, withdrawal, and academic achievement. Based on their scores, students were divided into aggressive, withdrawn, aggressive-withdrawn, and control groups. Adult criminal activity was assessed 10 years after first assessment (time two). Men who had been aggressive were four times more likely than control males to have committed a crime, and they committed crimes more frequently. As a group, women committed few crimes, and even women who had been aggressive were unlikely to commit crimes. Knowledge about social behavior in early adolescence was a more potent predictor of number and seriousness of crimes than knowledge about academic achievment. (ABL)

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Adult Criminal Activity among Adolescents Who Were Aggressive and Withdrawn

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Paper presented at the Annual Meeting of the American Psychological Association, New Orleans, August 1989.

CG 022 308

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Aggression, Withdrawal, and Academic Achievement: A Longitudinal Study of Criminal Activity into Early Adulthood

Information was collected for boys and girls in grade 7 (Time 1) about aggression, withdrawal, and academic achievement. Adult criminal activity was assessed ten years after first assessment (Time 2). Men who had been aggressive were four times more likely than control males to have committed a crime, and they committed crimes more frequently. As a group, women committed few crimes, and even women who had been aggressive were unlikely to commit crimes. Knowledge about social behavior in early adolescence was a more potent predictor of number and seriousness of crimes than knowledge about academic achievement.

Aggression, Withdrawal, and Academic Achievement: A Longitudinal Study of Criminal Activity into Early Adulthood

Longitudinal studies of the effects of aggression and social withdrawal on later development contribute to an understanding of how socially deviant behaviors may affect future adaptation. The present study is concerned with how aggression and social withdrawal are related to criminal activity approximately ten years after individuals were initially identified. Further, this study examines whether academic achievement provides supplementary or overlapping prediction of crime to that provided by knowledge about social behavior.

There are a number of studies indicating a relation between aggressiveness and later criminal activity among males (Loeber & Dishion, 1983; Parker & Asher, 1987). The relative improvement over chance prediction appears to be in the range of 22% to 51%. The support for the relation between aggressiveness and crime among females has been mixed. One study of girls aged 8 to 10 years (Roff & Wirt, 1984) found a relation between aggressiveness and later juvenile crime. Another study of younger girls, aged 6 years, did not find a relation between aggression and later crime (Ensminger, Kellam, & Rubin, 1983). One study of a mixed sample of boys and girls, aged 8, supported the relation between aggression and adult crime (Lefkowitz, Eron, Walder, & Huesmann, 1977).

There are few studies of the relation between social withdrawal and crime. One study of boys, 10 to 20-years-old, has supported a relation between social withdrawal and crime, but results of two studies of boys and

one study of girls has produced null results (Parker & Asher, 1987). Since the fearfulness component of social withdrawal appears to be related to the inhibition of inappropriate activity (Reznick, Kagan, Snidman, Gersten, Baak, & Rosenberg, 1986), it is possible that socially withdrawn children may have lower rates of criminal activity than control children. Thus, the study of the relation between social withdrawal and crime should be sensitive to the possibility that social withdrawal is a protective factor which may lead to a lower rate of criminal activity.

Several studies have indicated that poor school achievement is a predictor of later criminal activity (Loeber & Dishion, 1983). Poor school performance and delays in progress through school improve the prediction of crime over chance in the range of 15% to 34%.

In summary, there is considerable evidence among males for a relation between aggressiveness and later juvenile criminal acts. The evidence among females for a relation between aggressiveness and later crime is mixed. There is also evidence of a relation between poor educational achievement and later crime. Considering that aggressive children often have poor academic achievement, it is of interest to ascertain whether aggressiveness and school achievement are independent or overlapping predictors of crime.

Several issues were explored in the present study. Does elevated aggression during early adolescence predict elevated rates of criminal activity in early adulthood for both boys and girls? Does elevated aggression predict severity of crime in early adulthood? Is there a relation between social withdrawal and criminal activity? Does academic achievement during early adolescence predict criminal activity in early adulthood? Do aggression and academic achievement predict overlapping or

independent proportions of the variance in criminal activity?

Method

Identification of original sample pool

Assessments of aggression and withdrawal were collected using peer nominations for 1704 students in grade 7, when individuals were 13 years old. Individuals from the screening population were assigned to the aggressive group (N = 112) if they had scores equal to or greater than the 95th percentile on aggression, and scores below the 75th percentile on withdrawal. Individuals in the withdrawn group (N = 128) had scores equal to or greater than the 95th percentile on withdrawal and scores below the 75th percentile on aggression. The aggressive-withdrawn group (N = 36) consisted of those whose scores exceeded the 75th percentile on both aggression and withdrawal. The control group (N = 450) contained children who scored below the 75th percentile and above the 25th percentile on both aggression and withdrawal.

A detailed description of the administration and scoring procedures can be found in Moskowitz, Schwartzman, & Ledingham (1985). The percentile cutoffs were constructed to reflect different scores for each sex and grade subgroup. Moskowitz and associates (1985) found high reliability and stability for the peer nomination procedure used in this study.

Identification of the sample for this study

Records concerning the academic achievement of the subjects in the year of selection were available for most (83%) of the original subjects. The proportion of individuals in each group who had academic achievement scores was approximately equal (aggressive group = 86%; withdrawn group = 84%; aggressive-withdrawn group = 92%; control group = 82%).

Measures

Academic achievement. The school records contained scores on standardized mathematics and language achievement tests. The achievement tests were developed by the province to assess knowledge of the assigned curriculum for each year in each content area. The scores were stanines based on raw scores for all students in the province who had taken the test. The measure of academic achievement was based on the mean of the scores on mathematics and language achievement.

One issue that was examined was the extent to which individuals who were at the negative extreme on achievement were represented in the sample. Within the sample, 22% had scores equal to or below the 5th percentile. This distribution is comparable to the distribution of aggression and withdrawal scores. Noting that the direction of scores is reversed (i.e., high scores are in the negative direction), 16% of the sample had aggression scores equal to or above the 95th percentile, and 18% of the sample had withdrawal scores equal to or above the 95th percentile. Thus, the representation of extreme negative scores was similar for the variables of achievement, aggression, and social withdrawal.

Criminal activity. In Canada, criminal arrests are adjudicated in the provincial courts. Within the province, a court appearance subsequent to an arrest after the age of 18 is placed in a computer data bank that is accessible to the public. The computerized data banks were searched when the individuals were 23 years old which was 10 years after individuals were identified. Centralized medical records obtained from the province indicated that 95% of the sample still resided in the province and that there was no differential movement out of the province by classification

group (Moskowitz & Schwartzman, 1989). Thus, the search should have uncovered any court record for almost all of the subjects. Since it was found that virtually all court appearances that were completely adjudicated led to a conviction, the court appearances are referred to as crimes.

Severity of crime. Each crime was coded on a scale of severity (Rossi, Waite, Bose, & Berk, 1974) using coefficients for points on the scale determined by Cullen, Link, & Polanzi (1982) in their large scale study of people's perceptions of crime severity. The categories of crime (and their codes from the scale) were: Crimes against persons I - involving murder and manslaughter (8.10); Crimes against persons II - involving assault and rape (7.49); Selling illegal substances such as drugs (7.05); Crimes against persons III - involving lesser injuries or threatened injuries (6.92); Property crimes such as theft (6.56); Crimes against police such as resisting arrest (5.77); and Victimless crimes such as prostitution and use of illegal substances (5.67).

Results

Academic achievement. The academic achievement measure was analyzed for whether there were any differences between the groups at time of selection. A hierarchical multiple regression (Cohen & Cohen, 1983) was performed. Multiple regression was used, because this procedure adjusts for correlations among the independent variables. Vectors representing independent variables were entered in blocks in the following fixed order: sex, classification group, and sex by classification group. An effect is reported when entry of the block of vectors representing an independent variable lead to a significant increment in R-squared.

On the academic achievement variable, there were main effects for sex,

$F(1, 602) = 7.85$, $p < .001$, and classification group, $F(3, 599) = 16.28$, $p < .001$. Girls had higher academic achievement than boys (girls: $M = 4.64$, $SD = 1.67$; boys: $M = 4.28$, $SD = 1.48$). Scheffé comparisons (alpha = .05) indicated that all three deviant classification groups had achievement that was lower than the control group (see Table 1). The aggressive-withdrawn group had the lowest achievement, scoring significantly below the withdrawn group as well as the control group (Scheffé comparison, alpha = .05).

Insert Table 1 about here.

Who commits a crime. The percentage of individuals in each sex by classification group who committed a crime is presented in Table 2. The men who had been aggressive had the highest proportion of members who had committed crimes. The rate was more than four times the rate for control males. Use of this variable improves prediction over chance by 35.2% (for formula, see Farrington & Loeber, in press). Men who had been aggressive and withdrawn also had an elevated rate of committing crimes relative to the control males. Their rate was double that of control males. Relative improvement over chance prediction was 12.5%. Men who had been withdrawn had a low rate of committing crimes relative to all the other subgroups including the control males. Few of the women had committed crimes. There was no elevation in the proportion of aggressive women who had committed crimes relative to the other female classification groups.

Insert Table 2 about here.

Frequency of crimes. Given the low base rate of crime among women, they were omitted from subsequent analyses. Frequency of crimes was analyzed using two hierarchical multiple regressions in which the variables related to classification group and academic achievement were entered in inverted orders. In the first regression, the independent variables were entered in the following fixed order: classification group, academic achievement, and classification group by academic achievement. There was a main effect for classification group, $F(3, 319) = 3.07$, $p < .05$ (for means, see Table 1). Men who had been aggressive committed more crimes than men who had been in the control and the withdrawn groups (Scheffé comparison, alpha = .10). Men who had been both aggressive and withdrawn appeared to commit more crimes than men who had been in the control and the withdrawn groups, but the post hoc test was not significant.

In the second regression, academic achievement was entered before classification group. The inversion of the order of variables did not lead to any change in the previously reported results.

Seriousness of crime. A maximum seriousness score was computed for each male by taking the severity score of the most serious crime. Two hierarchical multiple regressions similar to the previous analyses of frequency of crime were calculated using maximum seriousness as the dependent variable.

In the first regression in which classification group was entered prior to academic achievement, there was a trend for a significant classification group effect, $F(3, 319) = 2.12$, $p < .10$. The men who had been aggressive committed more serious crimes than the men who had been withdrawn (Scheffé comparison, alpha = .10).

In the second regression, academic achievement was entered prior to classification group. There were no significant effects in this analysis.

Discussion

The results of the present study are consistent with previous reports that have found that males who are high on aggressiveness during childhood are more likely to commit crimes. Most previous studies have focussed on juvenile crime. The present study extends this finding to crimes during young adulthood. By age 23, almost 50% of the aggressive males have been prosecuted, compared to approximately 10% of the control males. Moreover, males who had been aggressive had a relatively higher rate of criminal acts; they were committing crimes three times more frequently than control males.

There was a trend indicating that men who had been aggressive adolescents were most likely to commit a severe crime. While most of the crimes were not violent, primarily involving theft, there was an occasional violent crime, such as assault. There are likely to be more violent crimes as these individuals progress through their 20's (Le Blanc & Frechette, 1989). Thus, by age 30, the results for crime severity may be similar to those reported by Huesmann, Eron, Lefkowitz, and Walder (1984) who at age 30 found differences in severity of adult crime as a function of childhood aggressiveness.

A very small percentage of men who had been withdrawn had committed any crime, and the severity of their few crimes was low relative to men who had been aggressive. Thus, there was some evidence that men who were socially withdrawn during childhood are less likely to commit crimes and that general behavioral inhibition, such as reflected in social withdrawal and fearfulness, is protective against committing crimes.

Men in the aggressive-withdrawn group had an elevated probability of committing a crime. Consequently, these men appear to be more like the aggressive males than the withdrawn males in the probability of engaging in crime. The protective effect of social withdrawal does not seem to outweigh the facilitating effect of a high level of aggression.

The percentage of women who had committed crimes was small, and most importantly, aggressive females were not more likely to commit crimes than any of the other subgroups of females. Since the aggressive females were selected as aggressive relative to other females, it is possible that females who are as aggressive as extremely aggressive males may have similar crime records. Such females are extremely rare, and it is known that it is quite difficult to make accurate predictions about individuals who have an extremely low base rate in the population (Meehl & Rosen, 1955). Thus, identifying females who are even more extreme than the 95th percentile on aggression and predicting their crime records would present difficult theoretical problems and is unlikely to have practical applications.

The conclusion that females who are high on aggression during early adolescence are not likely to commit crimes does not absolve this group of possible future antisocial spectrum behavior. For example, it has been demonstrated both retrospectively and prospectively that this group has an elevated risk for somatic complaints (Moskowitz & Schwartzman, 1989; Robins, 1986). These somatic complaints may influence attendance at work and lead to more irregular work histories, one of the symptoms of antisocial personality disorders.

Academic achievement was not found to be a predictor of frequency or severity of crime. Thus, the pattern of results strongly suggested that

knowledge about deviant social behavior was a more potent predictor of crime than knowledge about academic achievement. Notwithstanding the relation found between aggression and academic achievement at time of selection, knowledge about aggressive behavior is a far more useful predictor of crime in early adulthood than knowledge about academic achievement.

In conclusion, the present study contributes to the growing body of literature on the relation between aggression and crime in males by extending the age range in which aggression has been found to be an important predictor of crime from juveniles to young adults. Aggressive females do not appear to be at risk for committing crimes. The present study also suggests that the general inhibition associated with social withdrawal may have a protective effect on crime. Finally, this study demonstrated that social behavior, particularly aggressiveness, is a more important predictor of later crime than academic achievement.

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Table 1

Means and SD by classification group

Classification Group	M	SD	n
	Academic Achievement at Time 1[a]		
Aggressive	3.94	1.44	96
Withdrawn	4.26	1.60	108
Aggressive-withdrawn	3.23	1.34	33
Control	4.75	1.54	367
	Frequency of Crime[b]		
Aggressive	1.82	2.76	44
Withdrawn	.04	.19	53
Aggressive-withdrawn	1.78	4.76	23
Control	.61	3.74	203
	Most Serious Crime[b]		
Aggressive	7.47	11.71	44
Withdrawn	.25	1.26	53
Aggressive-withdrawn	6.58	21.85	23
Control	2.60	17.72	203

[a] Males and females

[b] Males only

Table 2

Proportion ef each subgroup who had committed a crime

	Men		Women	
Classification Group	Frequency	%	Frequency	%
Aggressive	20	45.5	2	3.8
Withdrawn	2	3.8	1	1.8
Aggressive-Withdrawn	6	26.1	1	10.0
Control	22	10.8	3	1.8